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RECORD OF ORAL HEARING

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte KOICHIRO TANAKA

Appeal 2007-0832
Application 09/842,797
Technology Center 2800

Oral Hearing Held: January 15, 2008

Before ANITA PELLMAN GROSS, ROBERT E. NAPPI, and MARC S. HOFF, Administrative Patent Judges

ON BEHALF OF THE APPELLANT:

ANDREW T. FOY, ESQ.
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The above-entitled matter came on for hearing on Tuesday, January 15, 2008, commencing at 9:00 a.m., at the U.S. Patent and Trademark Office, 600 Dulany Street, 9th Floor, Alexandria, Virginia, before Kevin Carr, Notary Public.

USHER BOBO-ALLEN: Good morning. Calendar Number 8. Appeal Number 2007-0832. Mr. Foy.

JUDGE GROSS: Thank you.

USHER BOBO-ALLEN: You're welcome.

JUDGE GROSS: Good morning.

MR. FOY: Good morning. My name is Andrew Foy, representative of the Appellant, Semiconductor Energy Laboratory.

JUDGE GROSS: You know you have 20 minutes on that clock.

MR. FOY: Yes. I've prepared an outline to address the claim subject matter and the rejection and the deficiencies in the rejection. To the extent that you have some specific questions, issues, concerns, I'm happy to depart from that to address them.

If you look at the claims, claims one through six are all independent, and they share some common features. I propose addressing independent claim one and the rejection in the context of independent claim one.

Independent claim one recites forming a crystalline region by irradiating a first region with a laser beam. It then has the next limitation, creating a second crystalline region by irradiating a second region using the same laser beam. That, we think, is critically important in view of the current rejection.

If you look at the rejection, the examiner is applying the 080 Patent of Yamazaki as teaching this feature of using the same laser beam to form two crystalline regions.

In particular, he points to four portions of the Yamazaki Patent. The first portion that he points to is column two, lines 20 to 35, and very clearly

in this portion of the Yamazaki reference, there are two laser beams that are being used to irradiate the semiconductor material.

He says a first laser irradiation to change the semiconductor layer into a single crystal, and then moving on, they talk about a second laser irradiation with a longer wavelength than what was used to irradiate the first region.

I think, therefore, it's pretty clear there are two different laser beams that are being used, whereas our claims require the same laser beam to be used.

Looking at the next portion that is cited by the examiner, he cites column four, lines 50 to 68, and column five, lines 1 to 5. Again here, we are talking about a two step annealing process, first creating a shallow crystalline region and then creating a deeper crystalline region.

The first annealing step is performed with a first laser, an excimer, an excimer laser irradiation, to form a shallow region of 5 to 100 nanometers in the surface.

Then a second laser annealing step is performed using an Yttrium aluminum garnet laser that penetrates the surface more deeply, about 50 to 1,000 nanometers, creating a deeper crystalline region.

Again, given that you use an excimer laser irradiation for the first annealing step and the Yttrium aluminum garnet laser for the second annealing step, it seems pretty clear there are two different laser beams that are being used.

The third portion relied upon by the examiner is column six, lines 1 through 10. This is again describing a two part annealing step. He's referring to the second portion of an annealing step.

If you look at column five, lines 27 to 34 of the Yamazaki reference, it describes the first annealing step. In that annealing step, it talks about irradiating with a pulse light emitted by a KRF excimer laser to crystallize the laminate. That is in the column five portion of Example 1.

Moving over to column six, the portion relied upon by the examiner, we are now using a continuous wave argon ion laser beam. Again, it seems pretty clear that it is a second laser beam and it is not the same laser beam as recited by our independent claims.

The final portion relied upon by the examiner is Figure 4 of the Yamazaki reference, which describes again the two part annealing process to create a first crystalline region, 402A, and then a deeper crystalline region using a second laser beam with a different wavelength that is deeper, and that is 402B.

JUDGE GROSS: I agree that the majority of the reference talks about two different lasers.

MR. FOY: Sure.

JUDGE GROSS: But in column four, lines 55 to 57, which I know the examiner referred to, how do you explain the statement "Where laser annealing is utilized, different wavelengths of laser irradiation are used or different pulse durations of a pulse laser are used?"

MR. FOY: Right.

JUDGE GROSS: Isn't that a suggestion that different pulse durations could be used instead?

MR. FOY: My response to that would be if you look at the first part of the sentence, and it does use "or" not "and," but it does say that two different laser beams would be used, and then in the context of the entire

disclosure of the 080 Patent, every example that is provided is to give -- is using two different laser beams, and that is to get to two different layers or to get to two different depths of the substrate.

You need to have -- it seems from the disclosure of this reference, you need to have two different beams of two different wavelengths to get the deeper penetration, the longer wavelength allowing you to create the deeper region, the shorter wavelength is not absorbed to the same extent, and that's how you come up with the shallow region.

The fact that you have this one dangling little phrase that says "or different pulse radiations" to me seems like a stretch to say that is suggesting that you are using the same laser beam, especially in view of the entire disclosure.

Are there any other questions that I can address, or do you feel that --

JUDGE GROSS: That's an explanation.

MR. FOY: Okay. I think also the claims recite the beams and saying it's the same beam. Not just the same laser, but it's the same beam. Here, if you were using different pulses, I think you might be able to say that is not the same beam because the first beam would have a certain frequency of pulse duration, the second beam would have a second frequency of pulse duration, therefore, two different beams.

JUDGE GROSS: Okay.

MR. FOY: If there are no further questions, I am happy to close.

JUDGE GROSS: Okay. Any further questions?

(No response.)

JUDGE GROSS: Thank you very much.

MR. FOY: Thank you.

JUDGE GROSS: Have a great day.

MR. FOY: Thanks. You, too.

(Whereupon, at 9:09 a.m., the hearing was concluded.)